NASA Policy Directive

NPD 8010.2E
Effective Date: March 04, 2007
Expiration Date: March 04, 2012

COMPLIANCE IS MANDATORY

Printable Format (PDF)

Request Notification of Change (NASA Only)

Subject: Use of the SI (Metric) System of Measurement in NASA Programs

Responsible Office: Office of the Chief Engineer

1. POLICY

Federal requirements for use of the SI system of measurement are established by the authorities referenced in Sections 3.a. and 3.b below. NASA policy for systems of measurement to be used on NASA programs/projects is as follows:

a. The International System of Units (commonly known as the SI - Systeme Internationale - or metric system of measurement) is the preferred system of weights and measurement for NASA programs and projects. Usage of SI for NASA programs and projects is defined by the references of Sections 4.a and 4b.below.

b. All new programs and projects covered by NPR 7120.5 shall use the SI system of measurement for design, development and operations, in preference to customary U.S. measurement units, for all internal activities, related NASA procurements, grants, and business activities. Exceptions to this requirement may be granted by the NASA Chief Engineer based on program/project recommendations by the responsible Mission Directorate Associate Administrator where use of SI units is demonstrated to be impractical, adds unacceptable risk, or is likely to cause significant inefficiencies or loss of markets to U.S. firms. Special emphasis shall be placed on maximum use of SI units in cooperative programs with international partners.

c. For the purposes of this policy, use of SI units may be considered impractical where it is demonstrated to result in substantial increases in cost or unacceptable delays in schedule to obtain SI components.

d. Each NASA program and project subject to NPR 7120.5 shall identify proposed use, exceptions, limitations, and support requirements for implementing the SI system of measurement prior to completion of the Systems Requirements Review or equivalent milestone during new Program/Project Formulation, as per Section 4.c. below. Determinations on where and how the SI system of measurement is to be used shall be documented in the Program or Project Plan, including use of SI units in related mission support and institutional projects.

e. Where full implementation of the SI system of measurement is not practical, as determined per Section 1.b above, hybrid configurations (i.e., a controlled mix of SI/non-SI system elements) may be used to support maximum practical use of SI units for design, development and operations. Where hybrid configurations are used, specific requirements shall be established to control interfaces between elements using different measurement systems.

f. Programs and projects shall minimize risk of errors by consistent labeling of measurement units throughout all documentation.

g. Soft SI units (numerical representation of non-SI measurements by SI units solely for the purpose of representing data in SI units) and dual units (data represented in both SI units and customary U.S. units of measure) shall not be used except where there is a specific need for ensuring compatibility, e.g., at hybrid interfaces or for clarity, such as in public affairs information. Dual units on drawings, when required, shall be in accordance with the requirements of the reference in Section 4.d below.

h. Existing programs and projects may permit continued use of non-SI units for projects currently designed in and based on non-SI units.

i. NASA shall encourage and accommodate increasing the use of the SI system of measurement as SI support capabilities expand, shall acquire capabilities to support that goal wherever practical, and shall cooperate with the

private and public sectors to overcome barriers to use and increase understanding of the SI system of measurement.

j. NASA shall establish and maintain an inventory of internal resources to support increased SI system of measurement use by programs and projects.

2. APPLICABILITY

This NPD is applicable to NASA Headquarters and NASA Centers, including Component Facilities, and to the Jet Propulsion Laboratory to the extent specified in the contract. The requirements of this NPD shall be included in NASA contracts, grants, and business activities, where applicable.

3. AUTHORITY

a. 15 U.S.C. §205b, Section 3 of the Metric Conversion Act of 1975, Public Law 94-168, as amended by the Omnibus Trade and Competitiveness Act of 1988, Public Law 100-418.

b. EO 12770, Metric Use in Federal Government Programs, dated July 25, 1991.

4. APPLICABLE DOCUMENTS

a. NPR 7120.5, NASA Program and Project Management Processes and Requirements.

b. ANSI/ASTM/IEEE SI-10, American National Standard for Use of the International System of Units (SI), the Modern Metric System.

c. Federal Standards 376B, Preferred Metric Units for General Use by the Federal Government.

d. ANSI/ASME Y14.5M, American Society of Mechanical Engineers Standard for Dimensioning and Tolerancing.

5. RESPONSIBILITY

a. The Chief Engineer is responsible for:

(1) Serving as the Metric Executive for NASA to meet the requirement of Sections 3.a and 3.b.

(2)Coordinating and overseeing implementation of this policy, including acting as the final decision authority for approval of exceptions set forth in Section 1.b. above.

(3) Consulting with the responsible Mission Directorate Associate Administrator to evaluate recommendations for use/exceptions to the SI system of measurement on programs/projects.

(4) Evaluating measurement system decisions and implementation for consistency with decisions and with this policy during program/project reviews conducted in accordance with NPR 7120.5.

(5) Maintaining an inventory of SI support capabilities within NASA.

b. NASA Mission Directorate Associate Administrators are responsible for:

(1) Consulting with the Chief Engineer on opportunities for increasing use of the SI system of measurement.

(2) Recommending to the Chief Engineer planned use of and demonstrated need for exceptions to the SI system of measurement programs and projects in accordance with Section 1.b. above.

(3) Ensuring that measurement system decisions are properly implemented and do not result in undue risk.

c. Program/Project Managers are responsible for:

(1) Conducting analyses and trade-off studies to evaluate use of the SI system of measurement for programs/projects and related NASA procurements, grants, mission support, institutional requirements, and business activities during the formulation process specified in NPR 7120.5.

(2) Recommending to the responsible Mission Directorate Associate Administrators during the Systems Requirements Review or equivalent activity where use of SI units for new programs/projects can be accomplished and demonstrating where it is impractical, adds additional unacceptable risk, or is likely to cause significant inefficiencies or loss of markets to U.S. firms.

(3) Documenting requirements and approved exceptions to use of SI units in program and project plans.

(4) Ensuring appropriate interface controls are established for use of hybrid configurations in accordance with Section 1.e above.

(5) Reporting progress and issues resulting from use of the SI system of measurement for programs/projects during design reviews and providing summary information to the Mission Directorate Associate Administrator.

(6) Reporting significant changes in proposed implementation of the SI system of measurement for programs/projects to the responsible Mission Directorate Associate Administrator and to the Chief Engineer for review.

d. Directors of NASA Centers are responsible for:

(1) Ensuring timely analysis, evaluation, documentation, and review of opportunities and requirements for use of the SI system of measurement on those programs/projects for which they have responsibility.

(2) Planning for and supporting use of the SI system of measurement except where the NASA Chief Engineer has approved an exception to use of the SI system of measurement as impractical, adding unacceptable risk, or is likely to cause significant inefficiencies or loss of markets to U.S. firms.

(3) Identifying needs, establishing, and maintaining institutional capabilities for providing effective and consistent support of the SI system of measurement for design, analysis, fabrication, test, and operations on current and future NASA programs/projects.

6. DELEGATION OF AUTHORITY

None.

7. MEASUREMENTS

None.

8. CANCELLATION

NPD 8010.2D, Use of the Metric System of Measurement in NASA Programs, dated May 14, 2004.

/s/ Michael D. Griffin
Administrator

ATTACHMENT A: (TEXT)

None.

(URL for Graphic)

None.

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NODIS
